

HUTTO Cylinder Grinding Equipment

RECOMMENDED FOR

HUDSON-ESSEX SERVICE STATIONS

BUILDING
GOOD WILL



MAKING
A PROFIT

With the HUTTO Portable Cylinder Grinder

A Precision Tool of Highest Quality and Remarkable Performance, giving the same high grade results in service as are being obtained with HUTTO Model KKS "Brake Type" production grinders at the factory

PROTECTION against accidental damage to the Hutto portable service grinder when not in use is afforded by the heavy metal box here shown, providing an inexpensive kind of insurance against the evil effects of the neglect to which some garage service tools of lesser importance from a precision point of view are commonly subjected. In supplying such a container the manufacturers emphasize a desire that users of Hutto grinders shall obtain from them the greatest possible amount of effective service as a result of taking proper care of the grinders at all times. With proper care Hutto grinders not only will last for a very long time but they will be found less troublesome in operation than any other cylinder reconditioning tools ever devised much easier to handle, faster and more accurate in action, and of much greater profit - producing capacity on account of the time they save and quality of work they do. Whenever the results obtained are not satisfying to the highest degree in any particular, it is certain that the reason or cause for the diffi-

culty encountered will be found in a failure to use the grinder precisely as directed, notwithstanding that the directions for use are extremely simple and easily followed.

An extremely important item among these instructions, however, calls for the use of an electric drill sufficiently powerful to drive the grinder fast enough to insure high-grade results while doing

honest - to-goodness corrective grinding - not mere polishing or burnishing. Another point it is wise to observe carefully is, check accuracy of work done and don't be satisfied with anything outside the Hutto half-thousandth limit. This particular point should under no circumstances be overlooked if service satisfaction of a higher grade is to be guaranteed to the owner.

Car owners are an appreciative lot of folks to the man who entertains a

thoroughly sincere desire to serve them efficiently. Good workmanship draws trade and holds it everywhere. Hutto grinders serve well in building profitable good will. They and the trade they build last.



Metal Box Serves to Protect Grinder Against Damage When Not in Use

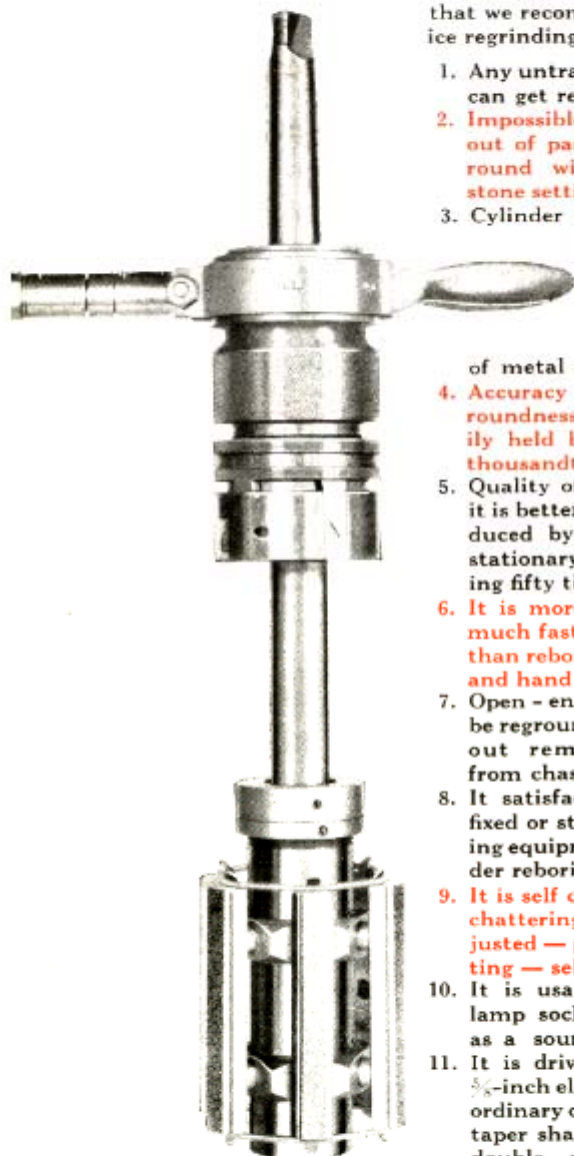
HUTTO-GROUND BORES WEAR LONGER because the close-grained hard-finish surface produced is free from high or low spots, chatter marks, and the fuzziness, which is usually of coarse thread-like appearance, commonly found in bores finished by "dry" grinding done with small abrasive wheels rotating at high speed

HUTTO PRODUCTION GRINDER

Below is a picture of the Hutto Model KKS twin-three production grinder used for finishing cylinder bores at the factory, where the grinder is driven by an ordinary single-spindle drill press.

With the exception of the driving head, which is equipped with an automatic stone-adjusting mechanism of micrometer type, this grinder embodies exactly the same principles of construction as the Hutto twin-three grinder that we recommend for service regrinding, because

1. Any untrained shop hand can get results with it.
2. Impossible to grind bores out of parallel or out of round with it because stone setting is positive.
3. Cylinder bores can be ground with it in from five to twenty minutes, depending on amount of metal removed.
4. Accuracy limits for roundness and taper easily held by it to half a thousandth.
5. Quality of work done by it is better than that produced by highest grade stationary grinders costing fifty times more.
6. It is more accurate and much faster in operation than re boring or reaming and hand lapping.
7. Open-end cylinders can be reground with it without removing engine from chassis.
8. It satisfactorily replaces fixed or stationary grinding equipment and cylinder re boring tools.
9. It is self centering—non-chattering—easily adjusted—positive in setting—self-aligning.
10. It is usable wherever a lamp socket is available as a source of current.
11. It is driven by portable 3/8-inch electric drill or by ordinary drill press, using taper shank adapter and double universal drive shaft shown on next page.
12. "Charging" of cylinder walls with abrasive particles from stones is entirely impossible with it.
13. The die-cast, metal-backed stones are serviceable even when cracked, chipped, or broken, being usable until worn out.
14. Quality of materials and workmanship guaranteed by the Hutto Engineering Co., Detroit, Mich., the manufacturers.
15. It pays for itself quicker than any other cylinder finishing tool ever produced.
16. Invaluable for making "trade-ins" move fast.



Model KKS Hutto "Brake Type" Production Grinder Used at Factory

HUTTO SERVICE GRINDER

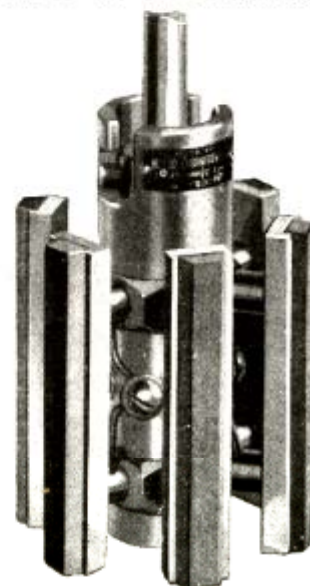
Details of Construction—The Hutto "twin-three" type of grinder for service work is constructed as indicated by the accompanying conventional vertical cross-sectional view, which shows the operative relationship of the various parts. One end of the driving spindle is designed for insertion in the chuck of the electric drill used for rotating the grinder, to the central or driving member of which the other end of the driving spindle is attached by means of a ball-and-pin type of universal, which permits of "offset" or out-of-line operation of the grinder without detrimental effect upon the quality of work done. This type of "universal" drive, with "bayonet" style of connection to the upper end of the grinder body, also provides for easy access to the stone-adjusting mechanism.

Under the driving spindle is the adjusting screw for drawing the upper and lower adjusting cones together so as to force the stoneholder pins, or jaws, outward and press the stones against the cylinder wall. The lower cone is slotted on one side to receive the end of a pin which prevents it from turning when the adjusting screw is turned.

When the adjusting screw is "backed off," or turned in an anti-clockwise direction, the adjusting cones are forced apart by the action of the coiled spring that surrounds the adjusting screw and bears on the small ends of the adjusting cones, and under the inwardly pulling influence of retaining springs provided for that purpose the stone-holder supporting pins or jaws move inward, relieving the stone pressure against the bore wall, thus permitting the grinder to be removed easily and without scratching the bore. The retaining springs keep the inner ends of the stone-holder supporting pins or jaws in contact with the adjusting cones at all times, so that whenever the adjusting screw is turned in a clockwise direction there is a positive outward movement of the pins or jaws towards the bore wall, against which the stone pressure developed, and hence the speed of grinding, depends on manipulation of the adjusting screw, a quarter turn of which sets out the stones approximately one thousandth of an inch.

Neither of the two adjusting cones is attached to the grinder body, within which both are therefore free to "float" to an extent sufficient not only to prevent binding of parts but to insure equalization of seating area and pin pressure on the two cones and thus make the stones self-aligning as well as self-centering.

Parts are proportioned to withstand hard, rough usage, also being hardened to resist wear, thus insuring long life in service—strength with durability.



Twin-Three Service Grinder
Price \$55.00
Extra Set Stones \$10.00

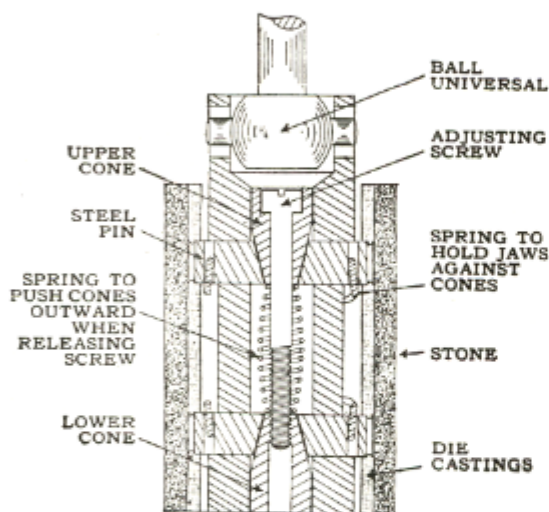
Purchase Grinders, Stones, and Other Hutto Products Through Your Jobber

Satisfactory Results are Easy to Get With Hutto Portable Service Grinders

Stones—The grinding elements or abrasive members of Hutto grinders for both service and production work are called stones. Service grinders have 4-inch stones set in die-cast metal run into steel holders having two ground steel pins or jaws whose outer ends are ground to conform to the angularity of the two oppositely positioned adjusting cones against which the pin, or jaw, ends are held in close contact by the strong inwardly-acting pull of retaining springs that tend always to force the stone holders towards the central driving body of the grinder.

Stones are made in four grades, namely: fine, for polishing only, removing not more than .0005, medium, and coarse, an extra-coarse or "roughing" stone also being made for use when a great deal of stock must be removed to true up a badly worn bore. When ordering stones be specific as to desired grade, selection of the latter depending on the amount of stock to be removed and character of finish desired.

Operating Instructions—Before proceeding with the work of regrinding, size up or gauge the cylinder



Cross Sectional View of Grinder Showing Principal Features of Construction

bore to find out to what size it will be necessary to grind them to suit whatever size of piston may be available. Be sure that all pistons used are of the same diameter and weight.

Wrap the crankshaft very thoroughly with rags to keep any abrasive or dirt from lodging in the bearings. Have plenty of clean kerosene on hand, also a can that will allow a generous flow of the kerosene into the cylinder while grinding.

Before starting to grind, decide whether the amount of stock to be removed demands the use of coarse, or "roughing," stones in order to remove stock quickly.

Before placing the grinder in bore of cylinder, examine the stones carefully to see if they have a "glazed" or polished appearance, because the presence of "glaze" destroys the cutting effect of the stones, which should have the dull grey appearance of cast iron. Glazing is caused by running the grinder too loosely in the cylinder bore, or may result from lack of enough kerosene. Glaze may be removed easily by using a "dressing stick" made for the purpose. The grinder must not be allowed to run in the cylinder bore loosely. Put the grinder in the smallest or least-worn part of the cylinder and

tighten the stone-adjusting screw. In other words, begin at the bottom of bore and work upward. Tighten the screw as much as possible and yet allow the motive power you are using to turn the grinder. Successful operation demands at least the power of the best $\frac{3}{8}$ -inch electric drill. If such a drill is being used, make it work to its limit. Work the grinder up and down, allowing it to grind at the tight spots, or where the work of the drill seems the hardest. When the grinder seems to speed up, **STOP** and again tighten the adjusting screw while the grinder is in the small or tight part of the bore. With a constant flow of kerosene while grinding and a continual repe-



Hutto Double Universal Drive Shaft and Special Fitting for Drill Chuck, Price \$8.50

tition of this process the bore will soon be straight and round. Keep in mind the fact that lack of kerosene or failure to keep the grinder tight in the bore will cause the stones to become glazed, when they will not cut. Keep them well dressed with a dressing stick or the edge of a file.

If the grinder is started when tight, and if the stones have been properly dressed, the grinder will remove about one-half thousandth of stock, the amount varying according to the softness or hardness of the cast iron in the block. Also it should be noted that the grinder will cut faster after the polished part of the old cylinder wall surface has been removed. The polished surface has the same effect as if very hard, so that unless the grinder is set up good and tight, as tight as a $\frac{3}{8}$ -inch drill will pull, getting through this hard skin will be slow.

There are a few items of caution that it is well to keep constantly in mind. Do not allow the grinder to extend beyond the cylinder bore, either top or bottom, farther than the center line of the outer pin. If in this respect care is not taken while the grinder is rotating, you are sure to wreck the grinder or break the stones.

After all the tight spots have been removed and the bore has the same "feel" from top to bottom, then the proper procedure is to make a light adjustment and work the grinder the full travel of the bore and as rapidly as possible, letting the grinder work itself to the point where it will not cut at any part of the cylinder. During this "finishing" process be sure to use plenty of kerosene. If this is done, the walls will have a wonderfully smooth finish and will be round, straight, or parallel, and will give the best of satisfaction in actual operation.

After one of the pistons has been fitted to the first bore in the block, the others may be used very much like plug gauges to which to grind and fit the other bores.



Double Universal Drive Shaft and Adapter for use in Drill Press. Adapter Shanks No. 2, No. 3, or No. 4 Morse Taper. Price of Adapter \$8.00. Double Ball Universal \$5.00

For regrinding cylinder bores of blocks removed from chassis, double universal drivers and adapters with No. 2, No. 3, or No. 4 Morse taper shanks, as here shown, are available for drill press operation of grinder.

Faster and Better than any other known method of Refinishing Cylinder Bores.

HUTTO Combined "Stroking" and Drill Stand

Easier, Faster Operation Than With Manual Control

POSITIVE mechanical control of the stroking movement of Hutto Portable grinders is as essential to speed in getting desired results in accuracy, finish, and quantity of stock removed as is regulation of the pressure with which grinding stones bear against cylinder wall. The higher the wall pressure the greater the grinding load and the harder it becomes to hold the electric drill while moving the attached grinder up and down in the bore.

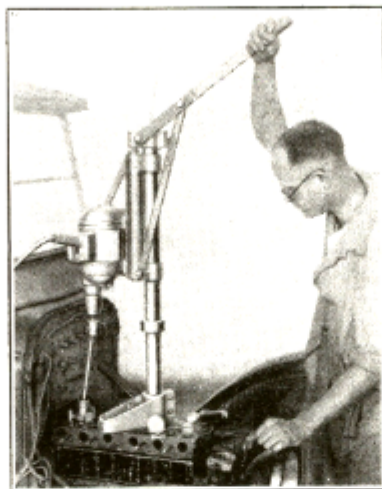
When the Hutto stroking stand is used, limitation of the up and down movement of the grinder, regardless of load on drill, is accomplished easily by setting stop collars on the column on which the drill-holding carrier, or fixture, is forced to slide up and down by manipulating the hand-lever control mechanism attached to the carrier.

When the stroking movement is thus limited, the operator is relieved of any fear that he may push his grinder too far down or pull it too far out of the bore. As a consequence he feels freer to increase both wall pressure and stroking speed, with the result that the work of grinding is done more quickly and with less physical effort than when the operator depends entirely upon manual limitation of the stroking movement.

is attached, and with which it is "square," is solidly bolted to the top of the cylinder block in such a position as ordinarily to bring the drill chuck directly over, or in line with, the cylinder bore center. Drive shafts with ball-and-pin type "universal" ends are provided, to compensate for lack of alignment, even when extreme, between the driving and driven members of the grinding outfit. The "foot" is slotted to receive one of the studs by which the cylinder head is held in place and which, when head is removed, serves equally well to hold the foot in position on top of the block. The stand, which is 38 inches high and weighs 27 pounds, can easily be adapted for other uses, such as drilling.

The accompanying illustrations serve to bring out the extreme adaptability of the stroking stand for purposes other than manipulation of the Hutto portable or service type of grinder to get quicker results with greater ease, ready attachment to bench or work being made possible by the supporting "foot." The operating handle may be used on either side of the column, all that is necessary to make the change

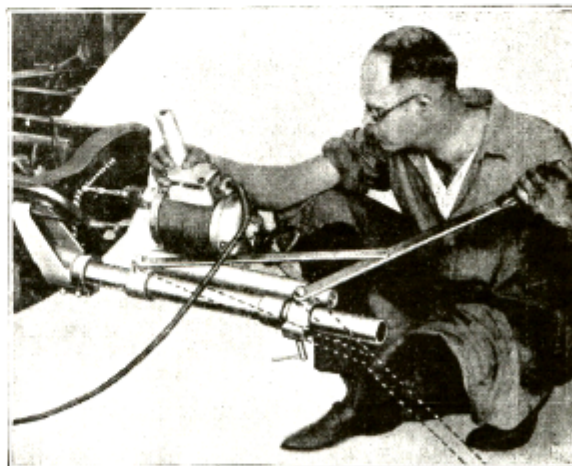
being to remove the upper link bolt, throw handle over to other side, and reconnect link in new position, as indicated by dotted lines in cut below, which



View of Stroking Stand showing how use of "Double Universal" Drive Shaft solves grinding problem when cylinder bores are out of line with electric drill



Stroking Stand Used as Bench Drill



Use of Stroking Stand for Shop Drilling Operations

The Hutto stroking stand provides a degree of rigidity that is extremely favorable to quick grinding action. The "foot" to which the vertical column

shows a shop drilling operation. Price, with double universal and drill chuck attachment \$41.00; stand alone \$32.50.

**SOLD BY AUTHORIZED HUTTO JOBBERS EVERYWHERE.
HUTTO FACTORY SERVICE MEN ALWAYS AVAILABLE.**

**For Further Information, Write Direct to Manufacturers, HUTTO ENGINEERING CO.
515 Lyncaste Ave., Detroit, Mich.**